DOCUMENT RESUME

ED 062 310 SP 005 707

AUTHOR	Lundgren, Robert Emil
TITLE	The Effects of Listening Training on Teacher Listening and Discussion Skills.
INSTITUTION	Stanford Univ., Calif. Stanford Center for Research and Development in Teaching.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
REPORT NO	TR-25
BUREAU NO	BR-5-0252
PUB DATE	Mar 72
CONTRACT	OEC-6-10-078
NOTE	87p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Discussion Experience; *Language Skills; *Listening Comprehension; *Listening Skills; Teacher Education; *Teaching Methods

ABSTRACT

This study sought to a) determine whether skill in extracting information could be improved by special training, and b) assess the effects of such training in classroom teacher-learner interaction. Fifty-four Stanford teacher trainees representing the subject-matter areas of social studies, English, mathematics, and science participated in the study. Half of each subject matter area group received the Xerox Corporation's "Effective Listening" training program and listening pre- and posttests, and half received the listening tests but no training. After training and/or testing, trainees were videotaped while conducting classroom discussions. They were given no information to indicate that the video tapes were related to the listening training program. Interns who received listening training improved on listening posttests relative to interns who did not receive training. Training in subject matter did not influence teacher performance. Three raters analyzed the video tapes of classroom discussions and tabulated teacher statements and questions related to input from statements. No significant treatment differences were found. Correlations in the experimental group show that those who did better in listening pre- and posttests also made better use of student input during classroom discussions. Results suggest that teachers' listening skills can be improved by training. Verbal evidence of transfer of training was not found. A 63-item bibliography, appendixes, tables, and illustrations are included. (Author/MJM)

STANFORD CENTER
FOR RESEARCH AND DEVELOPMENT
IN TEACHING

Technical Report No. 25

THE EFFECTS OF LISTENING TRAINING ON TEACHER LISTENING AND DISCUSSION SKILLS

Robert Emil Lundgren

School of Education
Stanford University
Stanford, California

March 1972

Published by the Stanford Center for Research and Development in Teaching, supported in part as a research and development center by funds from the United States Office of Education, Department of Health, Education, and Welfare. The opinions expressed in this publication do not necessarily reflect the position or policy of the Office of Education and no official endorsement by the Office of Education should be inferred. (Contract No. OEC-6-10-078, Component 1A.)

INTRODUCTORY STATEMENT

The Center is concerned with the shortcomings of teaching in American schools: the ineffectiveness of many American teachers in promoting achievement of higher cognitive objectives, in engaging their students in the tasks of school learning, and, especially, in serving the needs of students from low-income areas. Of equal concern is the inadequacy of American schools as environments fostering the teachers' own motivations, skills, and professionalism.

The Center employs the resources of the behavioral sciences--theoretical and methodological--in seeking and applying knowledge basic to the achievement of its objectives. Analysis of the Center's problem area has resulted in three programs: Teaching Effectiveness, Teaching Students from Low-Income Areas, and the Environment for Teaching. Drawing primarily upon psychology and sociology, and also upon economics, political science, and anthropology, the Center has formulated integrated programs of research, development, demonstration, and dissemination in these three areas. In the program on Teaching Effectiveness, the strategy is to develop a Model Teacher Training System integrating components that dependably enhance teaching skill. In the program on Teaching Students from Low-Income Areas, the strategy is to develop materials and procedures for engaging and motivating such students and their teachers. In the program on the Environment for Teaching, the strategy is to develop patterns of school organization and teacher evaluation that will help teachers function more professionally, at higher levels of morale and commitment.

This paper reports a study of training designed to improve the listening skill of teachers. It reproduces a dissertation bearing the same title submitted to the School of Education, Stanford University, 1971.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF ILLUSTRATIONS

ABSTRACT

Accurate reception of input affects all other cognitive events in a teacher's behavior during interaction with students. Research on listening indicates that most people operate at an efficiency level of 25 percent in general listening situations. If similar levels of listening proficiency are typical of classroom teachers, important teaching functions may be poorly executed or negated altogether. It is assumed that a teacher's ability to extract information in discussion situations promotes more effective interaction and learning. This study sought to determine whether skill in extracting information could be improved by special training, and to assess the effects of such training in classroom teacher-learner interaction.

Fifty-four Stanford teacher trainees ("Interns") representing the subject-matter areas of Social Studies, English, and Mathematics and Science participated in the study. Half of each subject-matter-area group received the Xerox Corporation's "Effective Listening" training program and listening pre- and posttests, and half received the listening tests but no training. After training and/or testing, Interns were videotaped while conducting classroom discussions. They were given no information to indicate that the videotapes were related to the listening training program.

Significant differences were found between experimental and control groups on listening posttests, despite the absence of pretest differences between the groups. Interns who received listening training improved on listening posttests relative to Interns who did not receive training. Training in subject-matter areas did not influence teacher performance on either pre- or posttests.

Three raters analyzed the videotapes of classroom discussions and tabulated teacher statements and questions in categories related to input from students. Eight categories pertained to verbal evidence that the Intern had heard the student input. No significant treatment differences were found. Correlations in the experimental group show that those who did better in listening pre- and posttests also made better use of student input during classroom discussions. For all Interns, listening pretest scores and Quantitative scores on the Graduate Record Examination accounted for more of the variance on listening posttest socres than did other aptitude variables. Except for the listening tests, aptitude variables did not serve to predict teachers' listening-related performance in classroom discussion.

The results suggest that teachers' listening skill can be improved by brief and highly systematic training programs such as "Effective Listening." All of the Interns who received training showed positive net changes from pre- to posttest, and most evaluated the training favorably. These findings lend encouragement to the development of similar programs more directly related to classroom interaction.

Though verbal evidence of transfer of training was not found, it would be unwise to conclude that training did not affect the teachers' ability to extract information in classroom discussion. Rating procedures required verbal evidence that the teacher had perceived the student input, which introduced the dimensions of verbal ability and personal style. More sensitive measurement techniques might reveal significant treatment effects.

CHAPTER I

THE PROBLEM: LISTENING AND TEACHING

Introduction

McDonald has stated (1965, p. 541) that, "The teacher's behavior and the way he interacts with pupils substantially influences what students want to learn and how they approach learning opportunities." The sizeable body of literature on teacher-pupil interaction that has been accumulating during the past few decades attests to the interest of researchers in this area of teacher behavior. More than 50 classroom interaction observation instruments have been developed in investigations of interaction processes and their effects on the behavior of teachers and students (Simon & Boyer, 1967). Many studies have been fragmentary and unrelated to theoretical models, but all have stressed the importance of teacher behavior and its effect on student learning. Studies by Anderson (1937), Withall (1949), Bales (1950), Flanders (1951, 1960, 1965), Cogan (1958), Ryans (1963), and Aschner and Gallagher (1965), are indicative of the interest of researchers in this area of teacher behavior.

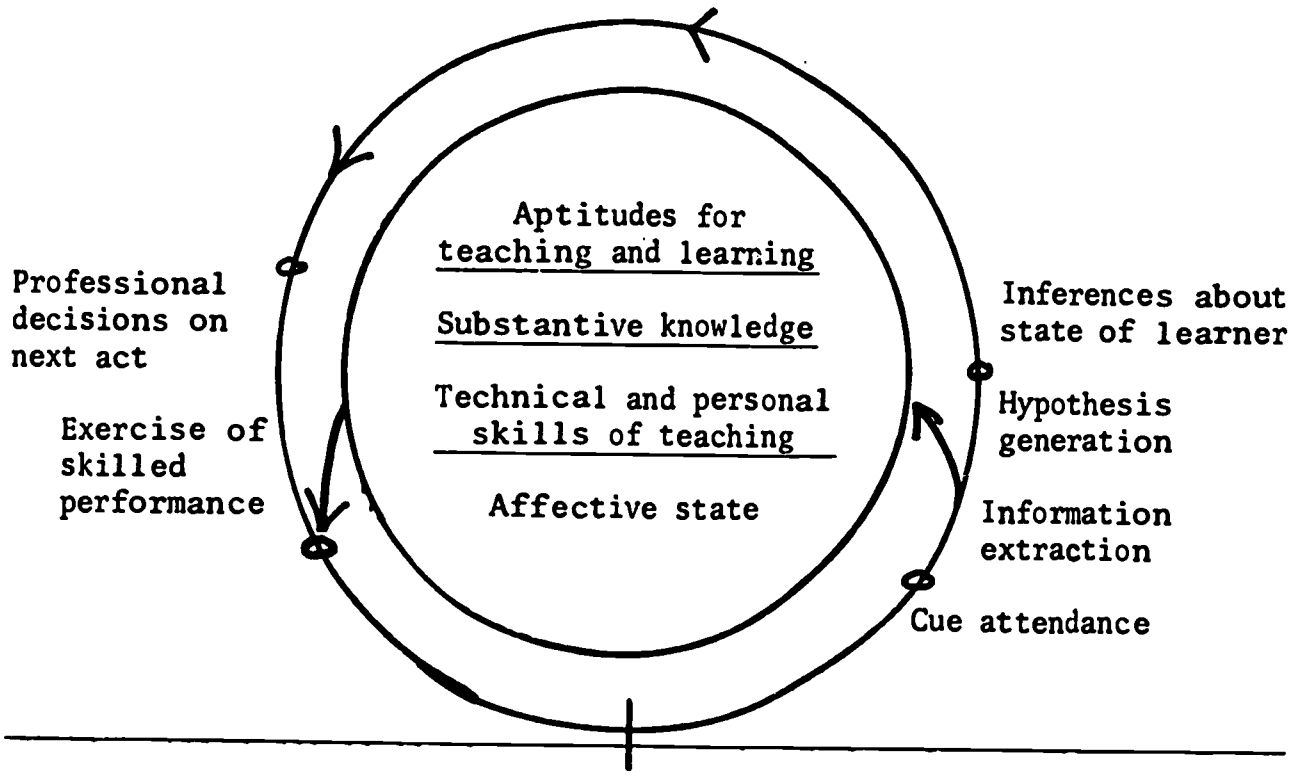
Miller (1967) emphasized that in a good communication system there is a systematic relationship between input and output, and that output is at least correlated with, if not completely dependent upon input. Given that most teacher-pupil interactions are characterized

by verbal communication, it follows that teacher behavior should be related to and contingent upon the teacher's skills and abilities in listening, and that students should be directly affected as a result.

The importance of listening skills may be illustrated by recent studies conducted at the Stanford Center for Research and Development in Teaching. The schema in Figure 1 (Snow, 1968) illustrates a cyclical pattern of cognitive events in teacher behavior during group discussion. Much of the early research in the Heuristic Teaching Program at the Center was concerned with performance skills, but increasing attention is being given to other cognitive events that are presumably involved in heuristic teaching behavior. Investigations by McDonald and Allen (1967), Aubertine (1964), Acheson (1964), Claus (1968), and Koran (1968) are illustrative of studies on the exercise of skilled performance. Recent work by Sieber (1968) and Salomon (1968) indicates increasing emphasis in the area of "Hypothesis Generation," but little attention previously has been given in the area of "Information Extraction" or "Cue Attendance" as specific cognitive functions in an interaction situation. Accurate reception of input affects all other cognitive events in teacher behavior in an interaction situation, however, for output at any point is a direct function of original input. If gross deficiencies were to exist in teachers in the area of listening skills, the impact of developmental programs in subsequent functions would obviously be diminished. Listening skills therefore are fundamental in heuristic teaching styles, and directly influence the teacher's behavior.

Figure 1

Temporal Course of Teacher-Learner Interaction



Some recent research on listening, however, indicates that most people operate at an efficiency level of approximately 25 percent in general listening situations (Nichols, 1957, 1961; Xerox Corporation, 1968; Nation's Business, 1966). If similar levels of listening efficiency are typical for classroom teachers, teaching functions may be poorly executed or negated altogether, since teacher responses may be based on incomplete or inaccurate reception of student input. Much valuable student input may presumably be ignored. Sustained meaningful interaction between teacher and learner requires that each participant

actively engage in processing, retaining, and using the contributions of the other.

The importance of listening skills in extracting information assumes greater significance when other studies are considered. Johns (1966) reported that students had more positive attitudes and were also more likely to ask thought-provoking questions when exposed to teachers who utilized their ideas and opinions. Pankratz (1967) related "effective" teaching to similar classroom behavior of teachers. Flanders (1965), Cogan (1963), Miller (1964), and Morrison (1966) all reported higher levels of achievement and more favorable attitudes when teachers utilized and built upon student ideas and opinions.

Improving the teacher's ability to extract information in discussion situations should be prerequisite to improving utilization of student input, and thus should promote more effective interaction and learning. This study sought to determine whether teacher skill in extracting information in verbal communication situations could be improved by special training, and to assess the effects of such training in classroom teacher-learner interaction.

A specific purpose of the study was to determine the value of listening training in pre-service preparation for teaching. Stanford teacher-trainees ("Interns") were available as subjects. It was hoped that the listening behavior of Interns in classroom interaction situations would be improved by a listening training program.

Another purpose of the study was to determine the relationship of other teacher ability variables to listening skill. As representa-

tions of general ability, Verbal and Quantitative scores on the Graduate Record Examinations were available for Stanford teacher-trainees, and could be used to predict final listening proficiency after training and in the classroom.

Another objective was to determine the degree to which listening training would alter specific teacher behavior in classroom interaction situations. Increased skill in extracting verbal information should permit teacher responses more directly related to student input. Analysis of videotape recordings of actual classroom discussions could determine relationships between listening test scores and listening performance in such discussions. Specific rating procedures would show the extent to which teachers utilize and build upon student input in subsequent discussion.

A final objective of the study was to determine the extent to which teachers in several specific subject-matter areas would be equally likely to benefit from listening training and utilize listening skill in classroom interaction situations.

The Research Problem

Ranklin's 1926 study was the first major attempt to measure the ability to understand oral communication, but it was followed by only 12 others through 1950. From 1951 through 1964, however, over 100 studies specifically related to listening abilities were reported (Duker, 1964). Much of this research examined the correlation between listening and other abilities, but more recent research has attempted to identify listening skills for which training procedures might be

developed (Nichols, 1957, 1961; Xerox Corporation, 1968). Several listening improvement programs have been developed, and research findings seem to indicate that listening skills can be improved through training (Canute, 1965; Duker, 1966; Xerox Corporation, 1968).

Listening skill obviously depends on hearing, but is more often defined as, "the process of interpretation." Brown (1954) suggested use of the term "auding" to distinguish listening to linguistic material from listening to other sounds, but his suggestion has not received wide acceptance. Taylor (1954) referred to the total act of "receiving auditory communication" as "listening," but also distinguished three stages of hearing, listening, and auding. He defined them as follows:

> Hearing is used to designate the process by which speech sounds in the form of sound waves are received and modified by the ear. . . . Listening refers to the process of becoming aware of sound sequences. In listening to speech, the person first identifies the component sounds and then recognizes sound sequences as known words through the avenues of auditory analysis, mental reorganization, and/or association of meaning. . . . Auding refers to the process by which the continuous flow of words is translated into meaning. Auding involves one or more avenues of thought--indexing, making comparisons, noting sequence, forming sensory impressions, and appreciating.

Regardless of whether one prefers to refer to the total act of receiving auditory communication as "listening," or to distinguish between stages, it is apparent that many factors act separately or in combination to influence the receipt of auditory communication. Taylor, in the same publication, also listed other factors that affect communication, such as background noise, conflicting conversations, mental and physical health, auditory fatigue, capacity for sustained

attention, visual distractions, the style and tone of the speaker, rate of input, skills of mental reorganization and association, and rate of speaking relative to rate of thinking. In a classroom discussion involving many participants, listening becomes even more complex and even more important, if the teacher is to be skillful in extracting and organizing information for later use.

In an attempt to improve listening efficiency, the Xerox Corporation recently developed a listening training program. Commercially marketed as EFFECTIVE LISTENING, the Xerox program is an audio-lingual programmed instruction course designed to help people capture the critical content of what they hear. It is a three-hour course consisting of 59 spoken episodes constructed around a variety of different subjects encountered in everyday life. After listening to statements on audio tape, students respond by answering specific questions or by summarizing the statements. Responses are made either orally or in a response booklet. In either case, the program provides for immediate reinforcement by permitting the student to compare his answer with the correct response. The Xerox Corporation (1968) designed the program to teach the following basic listening skills: editing mentally as the speaker progresses; organizing by main points and supporting reasons; remembering by the use of key words; summarizing and paraphrasing effectively; and, breaking through distractions such as background noise, speaker disorganization or emotionalism, and accents.

Experiments reported by Xerox indicate that EFFECTIVE LISTENING training produces significant results in almost every case (Xerox,

1968). Pre- and posttest scores have been reported for employees of 21 companies that have sponsored training programs, with gains from immediate pretests to posttests ranging from 21 to 64 points on a scale of 100. Reported data indicate that training effects are retained over time, with no reduction in listening skills as measured after five and ten months. Citing studies conducted at Ball State College and Cornell University with cross-sections of student populations, the Xerox report (1968) indicated that the attitude of students was highly favorable toward most aspects of the course; that posttest performance of experimental groups was significantly higher than that of control groups receiving no training; and that transfer and retention of listening skills to ability to summarize lecture content was greater for experimental groups both immediately after training and at periods of four to six weeks after training.

The intent of this study thus was to determine the value of the Xerox Corporation's listening program as pre-service training for teachers. It was hoped that the findings reported by Xerox could be replicated with a teacher-trainee population. With the Stanford teacher-trainee population as subjects, the following hypotheses were formulated:

1. Interns who receive listening training will evidence improvement in the specific listening skills emphasized in the training program, relative to Interns who do not receive training.
2. Interns who receive listening training will evidence

improvement in listening-related performance in specific classroom discussion, relative to Interns who do not receive training.

3. Listening posttest scores combined with other aptitude variables will predict teacher listening-related performance in specific classroom discussion.
4. Training in specific subject-matter areas will influence teacher performance on listening tests and teacher listening-related performance in specific classroom discussion.

The findings of the study should determine one of the values of providing listening training to pre-service teachers, and the extent to which teachers in specific subject-matter areas are likely to benefit from and use the listening skills emphasized in the training program in classroom discussions.

CHAPTER II

DESIGN OF THE STUDY

Pilot Study

Five months prior to the study, eight experienced Social Studies teachers from high schools in the Stanford area participated in a pilot study. Videotape recordings of classroom discussions were obtained prior to and after administering EFFECTIVE LISTENING training. The tapes were used for developing rating instruments and procedures and for training raters for the main study.

Pre and post listening scores were encouraging in that all of the net changes were in a positive direction (Appendix A). The teachers in this sample obtained higher listening scores prior to training than did those of comparison samples reported by the Xerox Corporation (1968), and consequently this sample showed a generally lower average gain. Ratings of classroom discussion behavior are not reported, since the tapes were used several times in training of raters for the main study. The tapes were stopped frequently to discuss statements in question, and the reliability of final ratings is subject to question.

During the analysis of the tapes obtained in the pilot study, however, it became apparent that some teachers were "performing"; there were obvious exaggerations of attempts to "listen" in the post-tapes. In one tape, for example, a teacher indicated to the class that he

wanted to listen to their comments that day, and he spoke a total of ten times during the entire discussion as opposed to thirty-five times prior to training. Interaction patterns changed in other tapes to a noticeable extent. While the teachers were possibly listening more effectively, it was impossible to find evidence in their verbal response to student input that would indicate transfer of skills emphasized in the training program.

To control these effects in the main study, it became necessary to give the impression that videotape recordings of classroom discussions were unrelated to the listening training that was to be used. Since less than half of the total Intern group would be participating in the main study, it would have become obvious that the tapes were related to the study if participating Interns were suddenly scheduled for recordings immediately prior to and after training, and non-participating Interns were not recorded. As a result, a Posttest-Only Control Group Design (Campbell & Stanley, 1963) was used to determine the effects of EFFECTIVE LISTENING training on teacher classroom discussion behavior. A Pretest and Posttest Control Group Design was employed to evaluate the EFFECTIVE LISTENING training program using the specific Xerox Corporation listening test (Table 1).

Subjects

Participating Interns were selected from a pool of about 100 Interns from the 1968-69 Stanford Class, representing the subject-matter areas of Social Studies, English, and Mathematics and Science. All Interns in these areas were contacted by letter, invited to

Table 1

Treatment Groups

Ss	N	Pre-List.	List. Trng.	Post-List.	VTR Obs.
Experimental Group					
English Interns	9	X	X	X	X
Soc.Stu.Interns	9	X	X	X	X
Math-Sci.Interns	9	X	X	X	X
Control Group					
English Interns	9	X	0	X	X
Soc.Stu.Interns	9	X	0	X	X
Math-Sci.Interns	9	X	0	X	X

participate in the study, and informed that a maximum of 60 participants could be accommodated. The first 60 who responded were then contacted for scheduling. Four could not be scheduled, and two others were not scheduled in order to maintain equality among subject-matter area groups. The final sample of 54 included 37 females and 17 males, all of whom had obtained baccalaureate degrees and were enrolled in the Stanford Teacher Education Program. Ages of Ss ranged from 21 to 31, but only five Ss were older than 24 years of age at the time of training. None reported having had formal instruction in listening prior to the study. Additional descriptive information is shown in Table 2.

When given the opportunity to participate in the study, Interns were informed that the major purpose of the study was to obtain their evaluation of the EFFECTIVE LISTENING training program developed by

Table 2

Description of Total Sample of Participating Interns and Subgroups Used in the Study

Group	Variable	Mean	S.D.	Maximum	Minimum	Range
All Ss	Age	23.02	1.91	31.00	21.00	10.00
	Undergrad GPA	3.12	.28	3.85	2.52	1.33
	GRE Verbal	617.04	80.01	790.00	460.00	330.00
	GRE Quant.	615.19	115.64	790.00	290.00	500.00
	(N=54; 17 Males and 37 Females)					
Exp. Ss	Age	23.33	2.39	31.00	21.00	10.00
	Undergrad GPA	3.08	.27	3.81	2.52	1.29
	GRE Verbal	606.30	76.67	740.00	480.00	260.00
	GRE Quant.	602.96	118.87	780.00	290.00	490.00
	(N=27; 11 Males and 16 Females)					
Control Ss	Age	22.70	1.23	26.00	21.00	5.00
	Undergrad GPA	3.15	.30	3.85	2.55	1.30
	GRE Verbal	627.78	83.27	790.00	460.00	330.00
	GRE Quant.	627.41	113.27	790.00	420.00	370.00
	(N=27; 6 Males and 21 Females)					
Soc. Stu. Exp.	Age	23.56	3.05	31.00	21.00	10.00
	Undergrad GPA	3.16	.22	3.57	2.95	.62
	GRE Verbal	592.22	80.28	740.00	490.00	250.00
	GRE Quant.	603.33	134.54	780.00	330.00	450.00
	(N=9; 4 Males and 5 Females)					
Soc. Stu. Control	Age	22.11	0.93	24.00	21.00	3.00
	Undergrad GPA	3.21	.40	3.85	2.55	1.30
	GRE Verbal	638.89	74.74	750.00	530.00	220.00
	GRE Quant.	628.89	113.63	760.00	430.00	330.00
	(N=9; 2 Males and 7 Females)					
English Exp.	Age	22.79	.83	24.00	22.00	2.00
	Undergrad GPA	3.01	.36	3.81	2.52	1.29
	GRE Verbal	638.89	78.81	730.00	520.00	210.00
	GRE Quant.	547.78	108.14	660.00	290.00	370.00
	(N=9; 3 Males and 6 Females)					

Table 2 (Continued)

Group	Variable	Mean	S.D.	Maximum	Minimum	Range
English Control	Age	22.79	.83	24.00	22.00	2.00
	Undergrad GPA	3.21	.18	3.44	2.97	.47
	GRE Verbal	623.33	74.68	720.00	520.00	200.00
	GRE Quant.	563.33	86.46	680.00	420.00	260.00
	(N=9; 2 Males and 7 Females)					
Math-Sci. Exp.	Age	23.68	2.83	31.00	22.00	9.00
	Undergrad GPA	3.12	.20	3.41	3.80	.61
	GRE Verbal	587.78	68.15	690.00	480.00	210.00
	GRE Quant.	657.78	96.54	760.00	480.00	280.00
	(N=9; 4 Males and 5 Females)					
Math-Sci. Control	Age	23.22	1.64	26.00	22.00	4.00
	Undergrad GPA	3.03	.28	3.41	2.68	.73
	GRE Verbal	621.11	105.65	790.00	460.00	330.00
	GRE Quant.	690.00	110.68	790.00	420.00	370.00
	(N=9; 2 Males and 7 Females)					
All Ss Pretest A	Age	23.54	2.50	31.00	21.00	10.00
	Undergrad GPA	3.16	.31	3.85	2.55	1.30
	GRE Verbal	606.92	76.83	740.00	460.00	280.00
	GRE Quant.	612.31	104.66	760.00	330.00	430.00
	(N=26; 10 Males and 16 Females)					
All Ss Pretest B	Age	22.54	.92	25.00	21.00	10.00
	Undergrad GPA	3.09	.26	3.81	2.52	1.29
	GRE Verbal	626.43	83.14	790.00	480.00	310.00
	GRE Quant.	617.86	126.85	790.00	290.00	500.00
	(N=28; 7 Males and 21 Females)					

the Xerox Corporation. They were not informed that any attempt would be made to determine the effects of training on classroom teaching behavior.

Treatment and Measurement Procedure

After stratification by subject-matter areas, each Intern was randomly assigned to an experimental or control group. Half of each of the three subject-matter area groups thus served as an experimental group, and half served as a control group, with a total of 27 Interns receiving EFFECTIVE LISTENING training and 27 other Interns not receiving training. Prior to administering listening training to the experimental group, all Ss took one of the two forms of the listening test provided by Xerox with the training program. These forms were counterbalanced, with half of each group receiving an alternate form of the test. Experimental Ss then received EFFECTIVE LISTENING training while control Ss received the alternate form of the test. Experimental Ss received the alternate form of the test immediately after completion of training. Training required two and one-half hours; testing required one-half hour. All Ss completed a 16 item evaluation survey after completion of the posttest. Tests and training were administered by two Research Assistants who were experienced in administering examinations and who had previously received EFFECTIVE LISTENING training. Tests were scored in accord with the objective scale provided by Xerox.

All Ss were given the same information prior to the pretest. They were told that a major purpose of the study was to obtain their professional evaluation of one of two programs produced by Xerox. They

were informed that one was a lengthy program that required approximately three hours, while the other was an abbreviated program that required about an hour. They were then told which program they were to receive.

Ss in the experimental group that received EFFECTIVE LISTENING training were then given copies of the "Listener's Response Book" developed by Xerox. They were informed that the first two statements to which they were to listen would be considered a pretest. After taking the pretest, they were given instructions on how to record responses in the booklet during the training. Listening training was then administered.

Control Ss were told that they would be evaluating the abbreviated program, and were then given mimeographed forms on which to respond. They were not informed that they were being tested, but were simply asked to listen to four statements on audiotape, and to write summaries after each statement.

After listening training and/or testing, participating Interns were contacted by technicians from the Audio-Visual Department of the School of Education concerning arrangements for video-taping of classroom discussions. Interns were informed that this was part of the routine procedure for the School of Education, and were given no information to indicate a connection with the listening training program. They were informed that their supervisors in the Secondary Education Program preferred that tapes be made during a classroom discussion rather than during a presentation or demonstration. Taping was thus scheduled as soon as possible after training, but with

consideration for control of time-lapse after training by experimental and control groups as well as by subject matter areas.

The experimental design employed in this research was thus a 2 x 3 design (Experimental vs. Control x Subject-matter Area) with listening pretest, posttest and classroom behavior as dependent variables. Listening pre- and posttests were counter-balanced, with half of each group receiving an alternate form of the test.

Predictor variables included Verbal and Quantitative scores on the Graduate Record Examinations, undergraduate grade-point averages, and scores on listening pretests. Prior research has shown each of the first three variables to be significant predictors of performance in teacher training programs. Listening pretest score was also considered an aptitude variable, and treated along with the other aptitudes. Raw posttest score was considered to be the proper dependent variable for the analysis.

Videotape Recordings

Technicians began making videotape recordings of classroom discussions immediately after Ss had received the posttest. It was anticipated that some tapes would be lost due to such factors as mechanical failure, operator error, illness or absence of Ss on scheduled taping days, and reluctance to conduct discussions for videotape recordings in some instances. Technicians were instructed to obtain recordings with consideration for control of time-lapse after training by treatment conditions as well as by subject-matter areas, and recordings were scheduled with these considerations in mind.

Three advanced graduate students were given training for the specific purpose of rating criterion behavior in the videotape recordings. The raters were informed of the purposes of the study, and were then asked to read a five page instruction manual which described the categories to be rated and contained examples of statements in each category (see Appendix B for a copy of the rating manual and form).

Classroom discussion measures aimed at behavior in which the Intern gave verbal evidence of having heard the input from the student. Measures are of repeating, rephrasing, or paraphrasing the input; advancing, elaborating, or otherwise building upon the input; referring to earlier input from students; and, summarizing. Under each of these categories, raters were to indicate whether or not the Intern had used "key" words from the student input.

Raters were given practice using the rating forms, and then worked with short sequences of recordings until they were thoroughly familiar with the mechanics of rating. They were also given extensive practice in identifying the units to be measured; each unit of teacher-talk was to be rated as one statement or question, regardless of whether it happened to be a simple "yes" or "no," or an occasional lengthy discourse. This procedure was developed during the course of analysis of tapes obtained in the pilot study, and proved to be adequate for determining verbal evidence of teacher use of student input. Raters practiced until they stopped accepting remarks such as "good," "okay," "all right," etc., as an indication of teacher use of

student input; such remarks were not considered evidence that the teacher actually heard what the student had said.

The work of the raters was thus primarily that of tabulating verbal behavior responses in the proper column on a form, once they had learned to identify and categorize them. The rater listened first to student input, indicated whether it was a statement or question, and then tallied the teacher's response in the proper category. Categories included those that indicated verbal evidence of having heard student input, or that acknowledged input but did not give verbal evidence of having heard it, or that pertained to administrative or control matters or new or unrelated topics.

Raters received 20 hours of training, using tapes obtained in the pilot study, prior to rating tapes obtained in the main study. Tapes were rated simultaneously, but the experimenter was present at all times to insure that the ratings were made independently by each rater. Ratings obtained are discussed in Chapter III.

CHAPTER III

STATISTICAL ANALYSES AND RESULTS

Overview

Analysis of variance and multiple linear regression were employed to test for the significance of treatment differences between groups, and for relationships between aptitude and criterion variables. Recordings of classroom discussions were analyzed by the same techniques. The data from the survey of opinions about EFFECTIVE LISTENING training are described by frequencies and percentages.

This chapter is divided into three main sections: analyses and results pertaining to specific listening tests; analyses and results relating to classroom discussion behavior; and a report of the opinion survey of EFFECTIVE LISTENING training by participating Interns.

Specific Listening Tests

Mean scores on EFFECTIVE LISTENING pre- and posttests are reported in Table 3.

To test for pretest differences between groups, an analysis of variance using a 2 X 3 design was performed. As shown in Table 4, no differences were found to be significant.

A similar analysis on posttest differences showed a significant treatment effect. As hypothesized, Interns who received EFFECTIVE

Table 3

Means and Standard Deviations for Effective Listening Pre- and Posttests

Group	Pretest $\bar{X}$	Pretest S	Posttest $\bar{X}$	Posttest S	Net Change
Soc. Stu. Exp.	52.94	19.73	72.33	12.94	+19.39
Soc. Stu. Control	68.50	12.42	68.83	13.76	+ .33
English Exp.	54.77	19.51	75.94	14.46	+21.17
English Control	55.94	18.82	64.61	21.77	+ 8.67
Math-Sci. Exp.	61.16	19.40	85.44	7.33	+24.28
Math-Sci. Control	61.55	31.77	68.22	24.61	+ 6.67
All Exp.	56.29	19.12	77.90	12.81	+21.61
All Control	62.00	22.24	67.22	19.84	+ 5.22

Table 4

Analysis of Variance on Effective Listening Pretest Scores

Source of Variation	Degree of Freedom	Sums of Squares	Mean Squares	F-ratio
Exp. vs. Control (T)	1	439.10	439.19	.99
Subject Matter Area (A)	2	390.90	195.45	.44
TA	2	656.51	328.25	.74
Within Groups	48	21311.64	443.99	
Total	53	22798.23		

LISTENING training did evidence higher listening skill scores after training than did those in the control group, using the .05 level of significance. Differences between subject-matter groups were found not to be significant (Table 5).

Table 5

Analysis of Variance on Effective Listening Posttest Scores

Source of Variation	Degree of Freedom	Sums of Squares	Mean Squares	F-ratio
Exp. vs. Control (T)	1	1541.34	1541.34	5.44*
Subject Matter Area (A)	2	492.79	246.39	.87
TA	2	426.52	213.26	.75
Within Groups	48	13591.82	283.16	
Total	53	16052.46		

*Significant at .05 level.

Correlation matrices including predictor variables and listening test scores are found in Tables 6 and 7.

The data were then analyzed using a stepwise multiple regression technique to investigate the relationship between independent variables and performance on listening tests. The variables used to predict listening posttest score in this analysis included sex, age, undergraduate grade-point average, listening pretest score, Quantitative and Verbal scores on the Graduate Record Examinations, order of tests (tests were

Table 6

Correlation Matrix of Predictor Variables and Listening Test Scores, Experimental Group*

	1	2	3	4	5	6	7
1	--	11	-06	06	22	51	-18
2		--	05	09	-30	26	29
3			--	-35	03	-01	-11
4				--	25	12	17
5					--	47	31
6						--	40
7							--

*Decimal Points Omitted.
$p < .05$ for $r = .38$

Order of Variables

1. Sex (0=Female; 1=Male
2. Age
3. Undergraduate Grade-Point Average
4. Verbal Score, Graduate Record Examination
5. Quantitative Score, Graduate Record Examination
6. Listening Pretest
7. Listening Posttest

counter-balanced), treatment group, and subject-matter area. The regression equations and order of entry are illustrated in Tables 8, 9, and 10.

The stepwise analysis made it apparent that some variables were more important in prediction than others. The four cognitive variables that accounted for most of the variance were then "forced" to enter a stepwise regression, in an order determined by correlations

Table 7

Correlation Matrix of Predictor Variables and Listening Test Scores, Control Group*

	1	2	3	4	5	6	7
1	--	20	-19	18	-18	15	-17
2		--	22	28	-20	27	17
3			--	02	00	09	03
4				--	14	61	25
5					--	13	48
6						--	39
7							--

*Decimal Points Omitted.
$p < .05$ for $r = .38$

Order of Variables

1. Sex (0=Female; 1=Male)
2. Age
3. Undergraduate Grade-Point Average
4. Verbal Score, Graduate Record Examination
5. Quantitative Score, Graduate Record Examination
6. Listening Pretest
7. Listening Posttest

Table 8

Stepwise Multiple Regression Results For Experimental Group

Step Number	Variable Entered	b	R	R^2
1	Subject-Matter Area	+ 2.98X	.43	.18
2	Listening Pretest Score	+ .25X	.54	.29
3	Test Order	- 9.26X	.65	.43
4	Sex	+11.61X	.68	.47
5	GRE Quantitative Score	+ .06X	.71	.51
6	Age	+ 2.22X	.76	.58
7	Grade-Point Average	- .12X	.79	.62
8	GRE Verbal Score	- .02X	.79	.62

Table 9

Stepwise Multiple Regression Results For Control Group

Step Number	Variable Entered	b	R	R^2
1	GRE Quantitative Score	+ .08X	.48	.23
2	Listening Pretest Score	+ .27X	.58	.33
3	Sex	+11.82X	.60	.36
4	Test Order	- 8.19X	.63	.39
5	Subject-Matter Area	- 2.84X	.63	.40
6	Grade-Point Average	- .08X	.64	.41
7	Age	- .68X	.64	.41
8	GRE Verbal Score	- .01X	.64	.41

Table 10

Stepwise Multiple Regression Results For All Subjects

Step Number	Variable Entered	b	R	R^2
1	GRE Quantitative Score	+ .07X	.34	.12
2	Treatment Group	+14.46X	.49	.24
3	Sex	+11.78X	.57	.33
4	Test Order	- 9.78X	.61	.38
5	Listening Pretest Score	+ .27X	.66	.44
6	Age	+ 1.59X	.68	.46
7	Grade-Point Average	- .08X	.69	.47
8	GRE Verbal Score	- .01X	.69	.47
9	Subject-Matter Area	- .46X	.69	.47

in Tables 6 and 7 (pages 23 and 24). The order was as follows: listening pretest scores, Quantitative scores on the Graduate Record Examinations, Verbal scores on the Graduate Record Examinations, and undergraduate grade-point averages. The results of the "forced" regressions are shown in Tables 11 and 12.

Table 11

Forced Regression Results For Experimental Group

Step Number	Variable Entered	b	R	R^2
1	Listening Pretest Score	+ .30X	.39	.15
2	GRE Quantitative Score	+ .08X	.58	.33
3	GRE Verbal Score	- .00X	.58	.33
4	Grade-Point Average	- .00X	.58	.33

Table 12

Forced Regression Results For Control Group

Step Number	Variable Entered	b	R	R^2
1	Listening Pretest Score	+ .22X	.40	.16
2	GRE Quantitative Score	+ .01X	.42	.18
3	GRE Verbal Score	+ .01X	.43	.19
4	Grade-Point Average	- .04X	.44	.19

Based on the information obtained from the regression analyses, listening pretest scores and Quantitative scores on the Graduate Record Examinations are most appropriate for purposes of prediction. The proportion of variance on listening posttest scores accounted for by linear regression on these two predictor variables is 33 percent for the experimental group and 18 percent for the control group.

A summary of the data obtained in the regression analyses is contained in Table 13. Although the analysis of variance indicated that there were no significant differences between subject-matter area groups on listening tests, regression information has been included for these groups in order to provide a descriptive presentation of results. Regression information for subject-matter sub-groups should be regarded with caution, however, since it is based on only nine observations.

Classroom Discussion Behavior

The form used for rating videotapes (Appendix B) included five major sections with subsections under one of the major sections. Evidence of teacher use of student input was tabulated in one of the following categories: repeating, rephrasing, or paraphrasing the input; advancing, elaborating, or otherwise building upon the input; referring to earlier input from students; and, summarizing. Under each of these categories, a sub-column was to be checked if the teacher used "key" words from student input. "Key" words or phrases were expected to occur with few exceptions in the category of repeating, but would not necessarily occur in the event of rephrasing or paraphrasing.

Table 13

Summary of Simple Regression Analysis on Effective Listening Posttest

Treatment	Variable	Mean	S.D.	Variance	Equation of Reg. Line	S.E. of Estimate	Correlation Coefficient
Exp. Ss	GPA	3.09	.27	7.32	Y= 94.26 - 05X	13.49	- .11
	GRE V.	606.30	76.70	5878.07	Y= 60.75 + 03X	13.38	.17
	GRE Q.	602.96	118.87	14129.34	Y= 58.08 + 03X	12.93	.31
	Pretest	52.30	19.12	365.55	Y= 62.80 + 27X	12.44	.40
	Posttest	77.91	12.81	164.14	----------		
Control Ss	GPA	3.15	.30	8.99	Y= 59.96 + 02X	21.02	.04
	GRE V.	627.77	83.27	6933.50	Y= 29.42 + 06X	20.35	.25
	GRE Q.	627.41	113.27	12820.16	Y= 14.94 + 08X	18.51	.48
	Pretest	62.00	22.24	494.42	Y= 45.73 + 35X	19.39	.39
	Posttest	67.22	19.85	393.99	----------		
Soc. St. Exp.	GPA	3.16	.22	5.06	Y= 49.23 + 07X	15.56	.13
	GRE V.	592.22	80.28	6444.50	Y= 55.70 + 03X	15.45	.17
	GRE Q.	606.33	134.54	18100.13	Y= 62.38 + 02X	15.46	.17
	Pretest	52.94	19.73	389.15	Y= 53.81 + 35X	13.28	.53
	Posttest	72.33	12.95	167.56	----------		
English Exp.	GPA	3.01	.36	13.16	Y= 93.14 - 06X	17.34	- .14
	GRE V.	638.89	78.81	6211.25	Y= 33.33 + 07X	16.33	.36
	GRE Q.	547.78	108.14	11694.51	Y= 47.29 + 05X	16.13	.39
	Pretest	54.78	19.51	380.63	Y= 60.47 + 28X	16.20	.38
	Posttest	75.94	14.46	209.03	----------		
Math-Sci. Exp.	GPA	3.12	.20	4.19	Y=146.99 - 20X	7.41	- .55
	GRE V.	587.78	58.15	4644.50	Y= 74.55 + 02X	8.75	.17
	GRE Q.	657.78	96.54	9319.41	Y= 84.40 + 00X	8.88	.02
	Pretest	61.17	19.40	376.31	Y= 83.91 + 03X	8.86	.07
	Posttest	85.44	7.33	53.66	----------		

Table 13 (Continued)

Treatment	Variable	Mean	S.D.	Variance	Equation of Reg. Line	S. E. of Estimate	Correlation Coefficient
Soc. S. Cont.	GPA	3.21	.40	15.64	Y= 93.26 - 08X	16.27	- .22
	GRE V.	638.89	74.74	5586.25	Y= 99.02 - 05X	16.12	- .26
	GRE Q.	628.89	113.63	12911.13	Y= 43.61 + 04X	15.73	.33
	Pretest	68.50	12.42	154.25	Y=102.81 - 50X	14.91	- .45
	Posttest	68.83	13.76	189.25	----------		
Eng. Control	GPA	3.21	.18	3.38	Y=112.80 + 55X	23.34	.47
	GRE V.	623.33	74.67	5575.13	Y= 35.59 + 47X	26.05	.16
	GRE Q.	563.33	86.46	7475.13	Y= .63 + 11X	23.55	.45
	Pretest	55.94	18.82	354.22	Y= 56.37 + 15X	26.18	.13
	Posttest	64.61	21.77	473.98	----------		
Math-Sci.Cont.	GPA	3.03	.28	7.66	Y= 60.34 + 03X	29.82	.03
	GRE V.	621.11	105.65	11161.25	Y= -6.09 + 12X	25.59	.51
	GRE Q.	690.00	110.68	12250.13	Y=-35.63 + 15X	21.95	.68
	Pretest	61.56	31.77	1009.40	Y= 34.54 + 55X	21.11	.71
	Posttest	68.22	24.61	605.51	----------		
All Subj. Area Groups Combined	GPA	3.12	.28	8.08	Y= 81.07 - 03X	17.67	- .03
	GRE V.	617.04	80.01	6402.11	Y= 50.58 + 04X	17.45	.16
	GRE Q.	615.19	115.64	13372.06	Y= 41.15 + 05X	16.64	.34
	Pretest	59.37	20.78	431.75	Y= 56.35 + 28X	16.71	.33
	Posttest	72.80	17.52	307.07	----------		

They were expected most frequently in instances of summarization.

The reliability of the ratings was analyzed for each category of discussion behavior, using an analysis of variance model described by Winer (1962). The analysis provides a correlation coefficient for the reliability of the mean rating by the judges, which is interpreted as the correlation between two sets of mean ratings for the same people, where two random samples of judges were used. The mean ratings by raters were then used as the dependent measures of classroom listening behavior. Estimates of inter-rater reliability are shown in Table 14.

It should be noted that Table 14 includes several more categories than those on the original rating form. From the information obtained on the forms, it was possible to create additional categories for analysis. The added categories included the following: number of student questions responded to by the teacher; number of student statements responded to by the teacher; number of student questions "used" by the teacher ("used" includes the categories of repeating-rephrasing, accepting-advancing, etc.); number of student statements "used" by the teacher; use of student input in a teacher statement; use of student input in a teacher question; total student-teacher interaction; and, total use of student input by the teacher. Also, the categories previously designated as "New," "Administrative," and "Other" were combined into a single category designated "Administrative or Other."

Analysis of Data

With the exception of one category of behavior, the estimates

Table 14

Estimates of Reliability of the Average Rating Assigned by Three Raters for Each Category of Teacher Classroom Discussion Behavior

Category of Behavior	Estimate for Mean of Three Raters
Repeat-Rephrase With Key Words	.958
Repeat-Rephrase Without Key Words	.859
Accept-Advance With Key Words	.906
Accept-Advance Without Key Words	.951
Ref. to Earlier Input Key Words	.889
Ref. to Earlier Input, Without Key Words	.892
Summarization With Key Words	.990
Summarization Without Key Words	.757
Acknowledgement of Input	.990
Total Use of Input by Teacher	.994
Number of Student Statements	.997
Number of Student Questions	.977
Number of Teacher Statements	.995
Number of Teacher Questions	.996
Administrative or Other, Teacher	.969
Stu. Statements Responded to by Teacher	.997
Stu. Questions Responded to by Teacher	.974
Stu. Statements Used by Teacher	.988
Stu. Questions Used by Teacher	.978
Use of Input in Teacher Statement	.994
Use of Input in Teacher Question	.989
Total Teacher-Student Interaction	.999

of inter-rater reliability were quite encouraging. "Summarization Without Key Words" was the only category that seemed to cause some difficulty for the raters. This was expected, since it is difficult to determine summarization unless key words are actually used; when they are used, it is easy to identify summarization, as the .990

estimate would indicate. By collapsing the four categories which distinguished between use or non-use of key words, the estimates were increased considerably. "Repeat-Rephrase" categories had an estimate of .956 when combined, and similar combinations produced estimates of .989, .963, and 1.000 for the categories of "Accept-Advance," "Reference to Earlier Input," and "Summarization," respectively. Use of the collapsed categories might have been better, since no estimate would have been lower than .956. Remembering by the use of key words was one of the skills emphasized in EFFECTIVE LISTENING training, however; therefore the data were analyzed with the original, uncollapsed categories.

A major decision was faced prior to further analysis of the data. The amount of time that teachers talked varied greatly within and between treatment and subject-matter groups. Teacher-talk time and total class time had been measured in minutes and hundredths, and length of classroom discussions varied as much as the total amount of time that individual teachers talked. One teacher talked 36.65 minutes of a total class length of 39.15 minutes; another teacher in the same cell talked 13.55 minutes of a total class length of 48.50 minutes. Teacher-talk time ranged from a low of 8.80 minutes to a high of 37.90 minutes. By subject-matter groups, total teacher-talk time ranged from 73.55 to 126.85 minutes. To create more sensitive measures of listening-related classroom behavior, the behavior tally in each category was converted to a proportion by dividing by the amount of teacher-talk time. Despite possible statistical problems involved in

using proportions, this appeared to be the most appropriate way to make initial comparisons and inferences. The data were treated by analysis of variance, conducted separately for each of the eight categories of variables related to teacher use of student input (Table 15).

In addition to the eight categories in which verbal evidence of having heard student input was given, a ninth category called "Total Use of Input by Teacher" was created. This latter category simply represents the total of the eight categories, and was created to use as a variable in the other analyses performed on the data. As indicated in Table 15, no significant treatment differences were found in any of the nine categories. In the category "Accept-Advance with Key Words," subject-matter area differences were significant at the .05 level. Cell and marginal means indicate that English teachers in both the experimental and control groups gave verbal evidence of having heard student input in this manner much less often than teachers in the other subject-matter areas. No attempt has been made to determine why this occurred. Data by subject-matter area groups relative to performance of specific classroom discussion behavior were analyzed, but not considered indicative because of the small cell sizes. Some video-tape recordings were lost because of mechanical failure, operator error, illness or absence of Ss on scheduled taping days, and reluctance to conduct discussions in some instances. Two Ss showed films on days that had been scheduled for the recordings, and five rotated among several small group discussions in different parts of the room, making it impossible to obtain a ratable audio recording. It was possible to

Table 15

Summary of Analysis of Variance for Teacher Classroom Discussion Behavior Variables Adjusted for Length of Teacher-Talk Time

Classroom Behavior Variable	Source of Variation	Degrees of Freedom	Sums of Squares	Mean Squares	F-ratio
Repeat-Rephrase With Key Words	Exp. vs. Control (T)	1	.00	.00	.00
	Subject Area (A)	2	2.37	1.18	2.36
	TA	2	.44	.22	.44
	Within Groups	30	14.93	.50	
	Total	35	17.74		
Repeat-Rephrase Without Key Words	Exp. vs. Control (T)	1	.03	.03	1.50
	Subject Area (A)	2	.07	.04	2.00
	TA	2	.04	.02	1.00
	Within Groups	30	.70	.02	
	Total	35	.84		
Accept-Advance With Key Words	Exp. vs. Control (T)	1	.00	.00	.00
	Subject Area (A)	2	.78	.39	3.55*
	TA	2	.11	.05	.45
	Within Groups	30	3.30	.11	
	Total	35	4.19		
Accept-Advance Without Key Words	Exp. vs. Control (T)	1	.28	.28	.44
	Subject Area (A)	2	.63	.31	.48
	TA	2	4.15	2.07	3.08
	Within Groups	30	19.13	.64	
	Total	35	24.19		
Ref. to Earlier Input With Key Words	Exp. vs. Control (T)	1	.00	.00	.00
	Subject Area (A)	2	.00	.00	.00
	TA	2	.01	.01	.00
	Within Groups	30	.06	.00	
	Total	35	.07		

*Significant at .05 level.

Table 15 (Continued)

Classroom Behavior Variable	Source of Variation	Degrees of Freedom	Sums of Squares	Mean Squares	F-ratio
Ref. to Earlier Input Without Key Words	Exp. vs. Control (T)	1	.01	.01	.00
	Subject Area (A)	2	.00	.00	.00
	TA	2	.01	.00	.00
	Within Groups	30	.03	.00	
	Total	35	.05		
Summarization With Key Words	Exp. vs. Control (T)	1	.00	.00	.00
	Subject Area (A)	2	.00	.00	.00
	TA	2	.01	.01	.00
	Within Groups	30	.13	.00	
	Total	35	.14		
Summarization Without Key Words	Exp. vs. Control (T)	1	.00	.00	.00
	Subject Area (A)	2	.00	.00	.00
	TA	2	.00	.00	.00
	Within Groups	30	.00	.00	
	Total	35	.00		
Total Use of Student Input By Teacher	Exp. vs. Control (T)	1	.64	.64	.31
	Subject Area (A)	2	1.23	.62	.30
	TA	2	6.25	3.12	1.52
	Within Groups	30	61.43	2.05	
	Total	35	69.55		

obtain ratable recordings for only 36 of the original 54 Ss, with six Ss in each of the six subject-matter area groups. Thus, the data shown in Table 16 are reported for descriptive purposes, but are not considered adequate to test the hypothesis that training in specific subject-matter areas would influence teacher performance of specific classroom discussion behavior. Comparison of descriptive information on these 36 Ss (Table 18, page 40) with that of the original 54 Ss (Table 2, page 13) shows very little difference in mean scores on aptitude variables for either group.

Despite the small number of ratable observations per cell and the differences in length of classroom discussion time recorded, it was decided to use analysis of variance on mean scores of unproportioned data to serve as a comparison for several categories of classroom discussion behavior. "Summarization with Key Words" was selected because it had the highest estimate of inter-rater reliability. "Total Use of Student Input by Teacher" was selected because it represented the total of the eight major categories. "Summarization without Key Words" was selected because it had been the most difficult to rate. The results of these analyses are shown in Table 17, and are similar to those for the proportioned data. The results of these latter analyses suggested that further analysis by categories would be of minimal value. Hypothesis number two therefore was not supported; Interns receiving EFFECTIVE LISTENING training did not evidence improvement in performance of specific classroom discussion behavior rated.

For descriptive purposes, correlation matrices were computed for

Table 16

Mean Scores on Categories of Teacher Use of Student Input
by Subject-Matter Groups Adjusted for Length of Teacher-Talk Time
(N=6 per Cell)

Behavior	Experimental			Control		
	S.S.	Eng.	M.S.	S.S.	Eng.	M.S.
Repeat-Rephrase With Key Words	.385	.603	.805	.350	.390	1.123
Repeat-Rephrase Without Key Words	.065	.077	.042	.097	.218	.035
Accept-Advance With Key Words	.920	.483	.887	.818	.650	.890
Accept-Advance Without Key Words	1.340	.718	.877	.730	1.765	.968
Ref. to Earlier With Key Words	.025	.002	.040	.005	.058	.005
Ref. to Earlier Without Key Words	.058	.000	.027	.000	.012	.000
Summarization With Key Words	.023	.000	.023	.015	.058	.000
Summarization Without Key Words	.000	.000	.000	.005	.000	.000
Total Use of Input by Teacher	2.813	1.900	2.697	2.003	3.158	3.018

all classroom discussion variables, with teacher-talk time added as a variable. These matrices may be found in Appendix C. One is a matrix for raw scores prior to adjustment for proportion of teacher-talk time, and the other is based on proportions of teacher-talk time to total

Table 17

Summary of Analysis of Variance for Three Categories of Teacher Classroom Discussion Behavior Unadjusted for Length of Teacher-Talk Time

Behavior	Source of Variation	Degrees of Freedom	Sums of Squares	Mean Squares	F-ratio
Summarization With Key Words	Exp. vs. Control (T)	1	.49	.49	.15
	Subject Area (A)	2	.49	.24	.73
	TA	2	.38	.19	.56
	Within Cols	30	10.02	.33	
	Total	35	11.38		
Summarization Without Key Words	Exp. vs. Control (T)	1	.12	.12	1.00
	Subject Area (A)	2	.25	.12	1.00
	TA	2	.25	.12	1.00
	Within Cols	30	.57	.12	
	Total	35	.99		
Total Use of Input by Teacher	Exp. vs. Control (T)	1	64.91	64.91	.19
	Subject Area (A)	2	1079.10	539.55	1.56
	TA	2	908.79	454.39	1.31
	Within Cols	30	10384.07	346.14	
	Total	35	12436.87		

class time. Input for both matrices was for all 36 Ss rather than for treatment and subject-matter groups.

As with the posttest listening data, regression techniques were used for analysis of classroom discussion behavior. The predictors used included Undergraduate Grade-Point Average, Verbal and Quantitative scores on the Graduate Record Examinations, and pre- and posttest listening scores. Summary information is shown in Table 18.

For all subjects combined, correlation coefficients relating classroom behavior and predictor variables are modest. Listening pre- and posttest scores have coefficients of only .06 and .23 with use of input by the teacher. For all subjects combined, the data are not sufficient to support the hypothesis that listening scores combined with aptitude variables would serve to predict teacher performance of specific classroom discussion behavior.

For subjects in the experimental group that received EFFECTIVE LISTENING training, listening pre- and posttest scores correlate .72 and .41 with use of input by the teacher; this is in contrast to subjects in the control group, where the same coefficients are -.21 and .17. The .72 correlation between pre-training listening skill and use of student input is important in its own right. Training in listening lowers the correlation to .41 by raising the scores of less skilled Ss. For example, only six experimental Ss scored 70 percent or above on the pretest; 14 of 18 scored 70 percent or above on the posttest. Rarely can past research show that an ability test of any kind can correlate .72 with classroom performance of teachers.

Table 18

Summary of Regression Analysis on Teacher Classroom Discussion Behavior

Treatment	Variable	Mean	S.D.	Variance	Equation of Reg. Line	S. E. of Estimate	Correlation Coefficient
Exp. Ss	GPA	3.12	.24	5.78	Y= 5.52 - 01X	1.13	- .22
	GRE V.	596.67	83.17	6917.65	Y= 1.34 + 00X	1.15	.15
	GRE Q.	605.56	138.87	19284.99	Y= .97 + 00X	1.10	.32
	Pretest	57.75	19.38	375.71	Y= .21 + 04X	.81	.72
	Posttest	77.36	14.99	224.88	Y= .21 + 03X	1.06	.41
	Use of Input	2.47	1.06	1.13	----------		
Control Ss	GPA	3.10	.32	10.06	Y= -.18 + 01X	1.84	.17
	GRE V.	637.22	87.77	7703.63	Y= 7.24 - 01X	1.74	- .36
	GRE Q.	646.67	116.72	13623.54	Y= 2.24 + 00X	1.87	.05
	Pretest	63.19	20.13	405.36	Y= 3.86 - 02X	1.83	- .21
	Posttest	69.78	18.76	351.83	Y= 1.66 + 02X	1.84	.17
	Use of Input	2.74	1.71	2.92	----------		
All Subject Area Groups Combined	GPA	3.11	.28	7.69	Y= 1.77 + 00X	1.53	.05
	GRE V.	616.94	86.75	7524.68	Y= 4.13 - 00X	1.51	- .15
	GRE Q.	626.11	128.14	16418.86	Y= 1.21 + 00X	1.50	.19
	Pretest	60.72	19.66	386.55	Y= 2.24 + 01X	1.52	.06
	Posttest	73.81	17.26	297.93	Y= 1.11 + 02X	1.49	.23
	Use of Input	2.53	1.46	2.14	----------		

The control pretest is erratic for unknown reasons. The -.21 pretest correlation could suggest non-random assignment, but could also indicate important subtle effects on the correlations by training. Since there was random assignment, we can only say that it is either chance or that something happened different to control and experimental subjects after random assignment but before or during the pretest. It is not likely that something different happened during the pretest, in that tests were counter-balanced, the same team of experimenters administrated the tests to both groups, and similar physical surroundings were used at the same time on the same days. It should be noted that the control and experimental groups' pretest scores also behave differently in correlation with other aptitude predictors (Tables 6 and 7, pages 23 and 24, and Table 18, page 40). Regardless of the reason for the erratic behavior with the pretest, the posttest performs perfectly in both experimental and control groups, and the relationship between pre- and posttest is adequate in both groups. The correlations in the experimental group clearly show that those who did better in listening pre- and posttests also did better on the criterion variable of use of student input.

Evaluation of EFFECTIVE LISTENING Training by Participating Interns

Immediately after completion of EFFECTIVE LISTENING training, Ss in the experimental group were asked to evaluate the training they had received by responding to a 16 item questionnaire. The questionnaire was in the back of the listener's response booklet, and was used essentially as the Xerox Corporation had prepared it. Exceptions were

that certain items were changed to relate more specifically to teachers, students, and administrative and supervisory personnel rather than sales and clerical personnel. Control subjects also responded to an evaluation questionnaire, but four items were deleted since they were not appropriate for subjects in this condition.

Subjects who received EFFECTIVE LISTENING training were quite favorable in their evaluation of most aspects of the course. Some 23 of 27 Ss indicated that the course had improved their listening skills, all but one felt that the course had enabled them to listen more effectively to statements heard in the everyday world, and 21 Ss felt that the course would improve the performance of teachers, students, and administrative and supervisory personnel. It was of interest to note that the three questions were separate; it was not the same 21 subjects who responded affirmatively in each case. All 27 felt that they were able to summarize a speaker's remarks as he was proceeding, after training; prior to training, only 17 felt they possessed this skill.

Answers to the comparable 12 items on the evaluation questionnaire completed by control Ss are also included in Table 19. They indicate that most of these subjects actually believed that they received an abbreviated listening training program rather than merely taking the listening pre- and posttests. While only 14 of the 27 control Ss indicated that they listened more effectively toward the end of the "course" than at the beginning, 20 felt that they better appreciated the importance of listening skills after completion of the course, and only three felt that the course would not improve the

Table 19

Frequency of Responses to Questionnaire Alternatives on Listening Training by Participating Interns

Question	Response	Exp. Ss	Control Ss
Many statements in the course might have been heard in the everyday world. Do you feel that the course will enable you to listen more effectively to such statements?	Yes	26	10
	No	1	16
	No Response or "other"	0	1
Did you listen more effectively toward the end of the course than at the beginning?	Yes	23	14
	No	3	10
	No Response or "other"	1	3
Do you feel that you better appreciate the importance of listening skills after completing the course?	Yes	21	20
	No	6	7
	No Response or "other"	0	0
Do you feel that this course would improve the performance of teachers?	Yes	21	12
	No	2	3
	Don't Know	3	12
	No Response or "other"	1	0
Do you feel that this course would improve the performance of administrative and supervisory personnel?	Yes	21	13
	No	1	2
	Don't Know	5	12
Do you feel that the organization of your spoken statements will be more effective as a result of this course?	Yes	12	9
	No	9	10
	Don't Know	6	8

Table 19 (Continued)

Question	Response	Exp. Ss	Control Ss
In general, do you feel that this course has improved your listening skills?	Yes	23	12
	No	4	14
	No Response or "other"	0	1
Which term below do you feel best describes the teaching level of this course?	Too easy	3	1
	Easy	10	6
	Suitable	13	17
	Difficult	1	1
	Too Difficult	0	1
	No Response or "other"	0	1
In which of the following categories do you feel the course will provide the greatest improvement to your listening skills?	Didn't help at all.	1	7
	Listening to all statements.	13	16
	Listening to general business statements.	2	0
	Listening to statements centering around a particular product or course of action.	11	0
	No Response	1	4
Do you feel that this course would improve the performance of students?	Yes	21	13
	No	0	5
	Don't Know	4	9
	No Response	2	0

Table 19 (Continued)

Question	Response	Exp. Ss	Control Ss
Before taking this course, were you able to adequately summarize spoken remarks as the speaker proceeded?	Yes	17	20
	No	10	6
	No Response	0	1
Were you able to summarize a speaker's remarks as he proceeded after taking this course?	Yes	27	23
	No	0	2
	No Response	0	2
How successful do you think audio-programmed instruction is as a teaching method? (Note: Subject to check whether he learned more, about the same, or less about listening than he would have learned from a teacher in the same amount of time.)	More	21	(Not asked)
	About the same	2	
	Less	2	
	No Response	2	
How do you like audio-programmed instruction? (Note: Subject to check less than, the same as, or more than the regular classroom method.)	Less than	3	(Not asked)
	The same as	5	
	More than	16	
	No Response	3	

performance of teachers. Three felt that the course had helped them to learn to summarize a speaker's remarks as he proceeded, and 14 felt that they listened more effectively toward the end of the course than they had at the beginning. The generally positive tone reflected by these

responses moderates to some extent the value of positive responses by experimental subjects, but also increases assurance that control subjects were not aware that they were serving as a control group.

Interns who received EFFECTIVE LISTENING training were also encouraged to comment on anything they liked or disliked about the training, and to make suggestions for improvement of the program for use with teachers and students. Immediate reinforcement and the diversity of content and voices were frequently mentioned as aspects of the program that were especially well-liked. Disliked aspects were that the program had been administered in a three-hour block instead of over a two-day period. Others questioned the necessity for the length of the program, and indicated that portions were too repetitious. Others mentioned that a major problem in normal listening situations is that of visual distractions, and that the training program could be improved if visual distractions could accompany some of the episodes. The other frequently cited dislike was that the program should have been administered individually, possibly in a language laboratory or media center, so that each person could proceed at his own rate.

Concerning suggestions for use of the training program for teachers or students, most Interns suggested that the program would be even more beneficial if the episodes were more directly related to situations faced in educational institutions. Episodes might involve conferences with parents and students, discipline and tutoring situations, individual and group counseling, techniques for improvement of instruction, etc. For students, episodes suggested were hints on how

to study and take notes, appropriate ways to ask for assistance or clarification from teachers, and similar things relating to situations faced daily by students. The obvious intent of these suggestions was not only that of making the situations more directly relevant to educational settings, but of teaching other things simultaneously with listening skills.

Some comments were quite general, and have not been included in this report. The overall impression one receives from reading the comments is that subjects who received EFFECTIVE LISTENING training felt it to be a valuable experience and recommended it for pre-service training for other teachers.

CHAPTER IV

DISCUSSION AND CONCLUSIONS

Review of the Study

This study sought to examine the value of listening training as pre-service training for teachers, and to determine the relationship of other teacher ability variables to listening skill. In addition, the study sought to determine the extent to which teachers in several subject-matter areas would be likely to benefit from listening training, and the extent to which such training would alter specific teacher behavior in classroom interaction situations.

The Xerox Corporation's EFFECTIVE LISTENING Training Program was used for testing and training listening skill. Independent variables used in analysis of listening skill included age, sex, undergraduate grade-point average, Quantitative and Verbal scores on the Graduate Record Examinations, order of tests, treatment group, and subject-matter area. Listening posttest score was the dependent variable. For analysis of classroom discussion behavior, independent variables were undergraduate grade-point average, Quantitative and Verbal scores on the Graduate Record Examinations, and listening pre- and posttest scores. The dependent variable was "use" of student input by the teacher.

After stratification by subject-matter areas, half of each of

three subject-matter area groups served as an experimental group and half served as a control group. A total of 27 Stanford Interns received listening training, and 27 others did not receive such training. Ratable videotape recordings of classroom discussions were obtained for 18 of the Interns in each group.

Summary of Results

Significant experimental versus control group differences on listening posttests were found, despite absence of pretest differences between groups. Interns who received listening training improved on listening posttests relative to Interns who did not receive training. Training in subject-matter areas did not influence teacher performance on pre- or posttests.

Due to loss of subjects, it was not possible to test for differences in teacher listening-related performance by specific subject-matter areas. For Ss in the experimental group, the listening pretest correlated .72 with use of student input, and training in listening lowered the correlation to .41 by raising the scores of less skilled Ss. Correlations in the experimental group show that those who did better in listening pre- and posttests also made better use of student input.

For all Ss, listening pretest scores and Quantitative scores on the Graduate Record Examinations accounted for more of the variance on listening posttest scores than did other aptitude variables. Other than for the listening tests, aptitude variables did not serve to predict teacher listening-related performance in classroom discussion.

Discussion of Results

Teacher listening proficiency should be of critical importance to success of classroom interaction, in that output is contingent on input. In this context, the results of this study are encouraging, since listening posttest differences were significant at the .05 level. The differences suggest that listening skill can be improved by relatively brief and highly systematic training programs such as EFFECTIVE LISTENING. Also encouraging is the fact that all of the Interns who received listening training showed positive net changes from listening pretest to posttest, and most were favorable in their evaluation of the training. Of the 27 Interns who received training, 21 indicated that the program would improve the performance of teachers, while only two felt that it would not, and four were uncertain. As to use of audio-programmed instruction as a teaching method, 21 also indicated that they felt they had learned more about listening than they could have learned from a teacher in the same amount of time (Table 19, pages 43-45). Positive training effects on the tests and positive attitudes toward audio-programmed instruction lend encouragement to development of similar programs more directly related to classroom situations.

Although a test of retention was not part of this study, data from Ball State University (Xerox Corporation, 1968) indicated that training was retained with no loss in skill six to ten weeks after training. The Xerox Corporation reported similar results for employees of the Equitable Life Insurance Company 10 months after training. Having replicated the Xerox Corporation's training results with Stanford

Interns in the present study, it might be supposed that retention effects would also have been verified if the present work could have included later testing.

There are several possible reasons for the failure to find other main effects of training on listening-related behavior in classroom discussion situations. The videotape rating procedure required verbal evidence that the teacher had perceived the student input. Without such a requirement, raters could have interpreted non-verbal stimuli in the classroom situation also, making their ratings considerably more subjective. The high estimates of reliability for each category of behavior rated lend assurance that the ratings obtained were objective, but some validity may have been sacrificed in the process. The requirement of verbal evidence also introduced the dimensions of verbal ability and style, which might vary considerably across the Interns who participated in the study. Thus, while verbal evidence of transfer of training was disappointing, it would be unwise to conclude that training did not affect ability to extract information in classroom discussion. The correlational evidence suggests that training in listening lowers the correlation between listening skill and use of student input by raising the scores of less skilled Ss. This result, in addition to the .72 correlation between pre-training listening skill and use of student input, is important in its own right.

Detection of transfer of training might have been facilitated through use of a micro-teaching format, with pre and post observations of brief classroom discussions. Since this was an initial study designed

to determine the value of listening training for a specific population, it was decided to seek direct evidence of transfer in actual classroom situations. Failure to obtain such evidence suggests that further work should aim at improved measurement techniques, more controlled teaching situations (like micro-teaching), or both.

Other factors obviously influence verbal and listening-related behavior in actual classroom situations. Noise, auditory fatigue, conflicting conversations, skills of memory and association, affective state, and visual distractions are all likely to influence teacher behavior in the course of teacher-learner interaction. Also, changes in teacher communication styles and skills are bound to occur over prolonged exposure to and interaction with a class of students. Periodic videotape recordings over a longer period of time for a smaller number of Interns might be a more profitable way of observing and measuring changes in listening behavior. Perhaps several recordings could be made both prior to and after teaching.

Inability to obtain ratable videotapes for all subjects also may have influenced the results, but this appears unlikely. Videotape recordings were scheduled with consideration for subjects in treatment conditions as well as subject-matter area groups, to maintain equality of cell sizes despite loss of recordings for one-third of the participating Interns. Scheduling in this manner insured that there were controls for delay in time of recording after training. Use of audio-tape recordings could have facilitated gathering of the classroom discussion data, and could have reduced some of the loss of data and

expense of the study. Audio recordings were rejected in favor of video to insure that raters were certain that the teacher rather than a student was talking, and also in the event that non-verbal teacher expressions would be analyzed as part of other studies. In retrospect, and in view of the numerous tapes that were lost due to mechanical failure and operator error, it appears that it would have been more appropriate to have obtained teacher-made audio recordings immediately after training, and have scheduled videotaping in addition. This could have been accomplished with little risk of compromising the lack of association of recordings with listening training, by requiring several recordings for other purposes prior to training. These procedures would have helped in determining whether training in specific subject-matter areas would influence teacher listening-related performance, something that could not be done adequately with the small cell sizes that remained after videotaping.

Lack of additional evidence of transfer of training to classroom discussion behavior is noteworthy also because it reinforces the suggestion that training is needed to help bridge the gap between teacher training programs and classroom performance. Many teacher education efforts may develop valuable and useful skills, but may fail to have full impact upon teacher behavior simply because there is little linkage between training practice and implementation in actual situations. Increasing efficiency in training may be of dubious value if the need for mediation mechanisms is not consciously and continuously included in planning.

Attention should be drawn to one other finding of the study. It was surprising to find that Quantitative scores on the Graduate Record Examinations accounted for more variance on listening tests than did Verbal scores on the same Examinations. This may indicate that listening skill relates more directly to abilities such as logical reasoning. It should also be noted here that Kelly (1962) found two other listening tests (Brown-Carlsen Listening Comprehension Test, and Sequential Tests of Educational Progress: Listening) to be correlated more highly with intelligence tests than with each other. Both of the tests correlated negatively with employee ratings of supervisors' listening behavior. Additional studies to determine whether the EFFECTIVE LISTENING tests measure cognitive skills other than listening would be important to pursue, and should be of benefit in developing more adequate measures of listening skill.

Conclusions

The findings of this study suggest that listening skills of classroom teachers can be improved through training. Improvement in listening skill was defined as the teacher's ability to extract information completely and accurately; the hypothesis that it should directly affect student-teacher interaction was not confirmed. Evidence of significant changes in actual classroom behavior due to training could not be obtained. It is suggested that measurement procedures used in this study were insufficient for this purpose.

Since this study was essentially concerned with evaluation of the Xerox Corporation's EFFECTIVE LISTENING Training Program for use

with a specific population, no attempt has been made to generalize to populations that differ from Stanford Interns. Having ascertained that the program does have an effect on listening skill with this population, it must now be determined how such effect can be used in improving student-teacher interaction. Hopefully, the result will be development of programs that can easily be inserted into ongoing in-service and pre-service teacher training programs at Stanford and elsewhere.

Revision of the audiolingual programmed instruction format to include visual distractions and other verbal and visual stimuli present in typical teaching situations could be accomplished through use of videotape or film. Scenes from actual classroom situations could be compiled and edited for this purpose, and should make training more directly relevant for teacher training programs.

In addition, a variety of models depicting ways of utilizing and building upon student input could be included in the training format, to promote observational learning of related skills. Subject-matter content and skill development could be emphasized simultaneously. Further work with such a training program could provide evidence of direct transfer to classroom situations, and improve the general quality of teacher-learner interaction. Such a program could make a substantial contribution to a model teacher education program.

BIBLIOGRAPHY

Acheson, Keith A. The Effects of Feedback from Television Recordings and Three Types of Supervisory Treatment on Selected Teacher Behaviors. Doctoral Dissertation. Stanford, Calif.: Stanford University, 1964.

Amidon, Edmund, and Flanders, Ned. The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior. Minneapolis, Minn.: Paul Amidon & Associates, 1963.

Anderson, Harold H. "An Experimental Study of Dominative and Integrative Behavior in Children of Pre-School Age." Journal of Social Psychology. 8:335-45, 1937.

Anderson, Harold H., and Fairbanks, G. "Common and Differential Factors in Reading Vocabulary and Hearing Vocabulary." Journal of Educational Research. 30:317-24. January, 1937.

Aschner, Mary J., Gallagher, James, et al. "A System for Classifying Thought Processes in the Context of Classroom Verbal Interaction." Urbana, Illinois: Institute for Research on Exceptional Children, 1965.

Aubertine, Horace E. An Experiment in the Set Induction Process and Its Application in Teaching. Doctoral Dissertation. Stanford, California: Stanford University, 1964.

Baral, D. P., Snow, R. E., and Allen, D. W. "A Taxonomy of Teaching Behaviors: Progress Report." Stanford, Calif.: Research and Development Memorandum No. 36, Stanford Center for Research and Development in Teaching. September, 1968.

Barbara, Dominick A. "The Art of Listening." Today's Speech. 7:5-7, February, 1959.

Bessent, E. W. Designs For In-Service Education. Austin, Texas: University of Texas Press, February, 1967.

Bloom, Benjamin S. (ed.). Taxonomy of Educational Objectives. Handbook 1: Cognitive Domain. New York: McKay Company, Inc., 1956.

Brewster, L. W. "Effects of a Brief Training Program in Listening Improvement. Speech Teacher. 15:8-10, 1966.

Brilhart, B. L. "The Relationship Between Some Aspects of Communicative Speaking and Communicative Listening." Journal of Communication. 15:34-46, March, 1965.

Brown, Donald P. Auding as the Primary Language Ability. Doctoral Dissertation. Stanford, Calif.: Stanford University, 1954.

Brown, Roger. Social Psychology. New York: The Free Press, 1965.

Caffrey, John. "Auding Ability at the Secondary Level." Education. 75:303-10, January, 1955.

Campbell, Donald T., and Stanley, Julian C. "Experimental and Quasi-Experimental Designs for Research." Reprinted from N. L. Gage (Ed.), Handbook of Research on Teaching. Chicago: Rand McNally & Co., 1963.

Canute, R. J. "Exploratory Evaluation of Certain Aspects of the Listening Program as a Part of the Study Skills Course at the University of Wyoming." Journal of Educational Research. 59: 51-4, October, 1965.

Claus, Karen E. S. The Effects of Modeling and Feedback Variable on Higher-Order Questioning Skills. Doctoral Dissertation. Stanford, Calif.: Stanford University, 1968.

Cogan, Morris L. "The Relation of the Behavior of Teachers to the Productive Behavior of Their Pupils." Journal of Experimental Education. 27:89-124, December, 1958.

_____. "Research on the Behavior of Teachers: A New Phase." Teacher Education. 14:238-43, 1963.

Devine, T. G. The Development and Evaluation of a Series of Recordings for Teaching Certain Critical Listening Abilities. Doctoral Dissertation. Boston: Boston University, 1961. From Dissertation Abstracts, 22:3546-7, No. 10, 1962.

_____. "Listening." Review of Educational Research. 37:152-8, April, 1967.

Duker, Sam. Listening Bibliography. New York: Scarecrow Press, 1964.

_____. Listening: Readings. New York: Scarecrow Press, 1966.

Edwards, A. Experimental Design in Psychological Research. New York: Holt, Rinehart, Winston, 1965.

Ekwall, E. E. "Improving Listening Skills." Arizona Teacher. 54:12-13, November, 1965.

Flanders, Ned A. Teacher Influence, Pupil Attitudes, and Achievement. U. S. Department of Health, Education, and Welfare. Cooperative Research Monograph No. 12, 1965.

Flanders, Ned A., and Simon, Anita. "Teacher Effectiveness." Encyclopedia of Educational Research. New York: Macmillan & Co., 1960.

Gage, N. L. "An Analytical Approach to Research on Instructional Methods." Phi Delta Kappan. June, 1968.

Hollingsworth, P. M. "The Effect of Two Listening Programs on Reading and Listening." Journal of Communication. 14:19-21, 1964.

_____. "Effectiveness of a Course in Listening Improvement for Adults." Journal of Communication. 16:189-91, 1966.

Horowitz, M. W. "Organizational Processes Underlying Differences Between Listening and Reading as a Function of Complexity of Material." Journal of Communication. March, 1968.

Ishler, R. E. "Teacher Verbal Behavior Related to Listening." Journal of Educational Research. 61:121-23, 1967.

Johnson, Wendell. Your Most Enchanted Listener. New York: Harper and Bros., 1956.

Keller, Paul W. "Major Findings in Listening in the Past Ten Years." Journal of Communication. 10:29-38, March, 1960.

Kelly, Charles M. Actual Listening Behavior of Industrial Supervisors, as Related to Listening Ability, General Mental Ability, Selected Personality Factors, and Supervising Effectiveness. Doctoral Dissertation. Purdue University, 1962.

Koran, John J., Jr. The Relative Effects of Imitation Versus Problem Solving on the Acquisition of a Complex Teaching Skill. Doctoral Dissertation. Stanford, Calif.: Stanford University, 1967.

McDonald, Frederick J. Educational Psychology. Belmont, Calif.: Wadsworth Publishing Co., 1965.

McDonald, Frederick J., and Allen, D. W. Training Effects of Feedback and Modeling Procedures on Teaching Performance. Stanford, Calif.: Stanford Center For Research and Development in Teaching. Technical Report No. 3, 1967.

Miller, George A. The Psychology of Communication. New York: Basic Books, Inc., 1967.

Monaghan, R. R., and Martin, J. G. "Symbolic Interactions: Analysis of Listening." Journal of Communication. 18:127-30, 1968.

Neisser, Ulric. Cognitive Psychology. New York: Appleton-Century-Crofts, 1966.

National Council of Teachers of English. "The Program in Listening," and "Teaching Listening." The English Language Arts. New York: Appleton-Century-Crofts, 1951.

Nichols, Ralph G. "Big Pitchers Now Have Big Ears." Nation's Business. December, 1958.

Nichols, Ralph G., and Stevens, Leonard A. Are You Listening? New York: McGraw-Hill Book Co., Inc., 1957.

_____. "Listening to People." Harvard Business Review. September, 1957.

_____. "Do We Know How to Listen?" Speech Teacher. 10:118-24, March, 1961.

Rankin, Paul T. The Measurement of the Ability to Understand Spoken Language. Doctoral Dissertation. University of Michigan, 1926. Dissertation Abstracts. 12:847, 1952.

_____. "The Importance of Listening Ability." English Journal, October, 1928.

Reddin, E. "Listening Instruction, Reading, and Critical Thinking." Reading Teacher. 21:654-8, April, 1968.

Ryans, David G. "Prediction of Teacher Effectiveness." Encyclopedia of Educational Research. New York: Macmillan & Co., 1960.

_____. "Some Relationships Between Pupil Behavior and Certain Teacher Characteristics." Journal of Educational Psychology. 52:82-90, April, 1961.

_____. "Teacher Behavior Theory and Research: Implications for Teacher Education." Journal of Teacher Education. 14:274-93, 1963.

Salomon, Gavriel. Interaction of Communication-Medium and Two Procedures of Training for Subjective Response Uncertainty of Teachers. Doctoral Dissertation. Stanford, Calif.: Stanford University, 1968.

Seiber, Joan E. "Overcoming Secondary Ignorance: Learning to be Uncertain." Stanford, Calif.: Stanford Center for Research and Development in Teaching. Research Memorandum No. 17, January, 1968.

Simon, Anita, and Boyer, E. Gil. Mirrors for Behavior. The Center for the Study of Teaching and Research for Better Schools, Temple University, 1967.

Snow, Richard E. "Heuristic Teaching." Third Annual Report. Stanford, Calif.: Stanford Center for Research and Development in Teaching, 1968.

_____. "Toward a Model of Teacher-Learner Interaction." Stanford, Calif.: Stanford Center for Research and Development in Teaching. Research Memorandum No. 18, January, 1968.

(Staff Report.) "Now Hear This." Nation's Business. Augu. :, 1966.

Taylor, Stanford E. "Listening." Washington, D. C.: National Education Association, 1964.

Toussaint, Isabella H. "A Classified Summary of Listening." Journal of Communication. 10:125-34, September, 1960.

Winer, B. J. Statistical Principles in Experimental Design. New York: McGraw-Hill Book Co., 1962.

Withall, John. "The Development of a Technique for the Measurement of Social-emotional Climate in Classrooms." Journal of Experimental Education. 17:347-61.

Witty, Paul A., and Sizemore, Robert A. "Studies in Listening: A Postscript." Elementary English. 36:297-301, May, 1959.

Xerox Corporation. "Effective Listening Validation Report." New York: Xerox Corporation, 1968.

_____. "To Answer Your Questions About Effective Listening in Education." New York: Xerox Corporation, 1966.

APPENDIX A

SUMMARY OF EFFECTIVE LISTENING PRE- AND POSTTEST DATA, PILOT STUDY

SUMMARY OF EFFECTIVE LISTENING PRE- AND POSTTEST DATA,
PILOT STUDY

Subject	Pre-Test			Posttest			Net Change
	Ques.1	Ques.2	Score	Ques.1	Ques.2	Score	
1	12	18	15.00	95	100	97.50	82.50
2	100	37	68.50	69	73	73.50	5.00
3	61	41	51.00	100	73	89.00	38.00
4	56	5	30.50	41	34	37.50	7.00
5	34	41	37.50	95	100	97.50	60.00
6	56	77	66.50	86	66	76.00	9.50
7	78	23	50.50	82	34	58.00	7.50
8	61	46	53.50	77	78	77.50	24.00
$\bar{X}$	57.25	36.00	46.63	80.62	76.00	75.81	29.19
σ	24.64	20.23	24.55	34.68	23.95	19.06	27.02

APPENDIX B

INSTRUCTIONS FOR RATING VIDEOTAPE RECORDINGS, AND RATING FORM

Instructions for Rating Videotapes

This study is specifically concerned with listening behaviors of teachers during classroom discussions. The teachers involved in the study have participated in one of two forms of listening training designed to teach the following basic skills: editing mentally as a speaker progresses; remembering by the use of key words; summarizing and paraphrasing; and, organizing by main points and supporting reason. In order to determine the effect of these training programs on the behavior of teachers in classroom discussion situations, we want a record of each instance of verbal behavior that gives evidence of use of these skills. You are asked to listen first to the statement or question from a student, and then to mark the rating form to indicate whether or not the teacher's response included verbal evidence of having heard the student's remark.

Rating Form

The rating form includes four major sections with subsections under one of the major sections. The first section is designed to provide the ratio of student-teacher comments. When a student is speaking, place a check under the first column and do not attempt to rate the other categories on the form with the exception of indicating whether it was a statement or a question. Each instance is to be counted as one statement or question, although it might vary from a simple "Yes" or "No" to an occasional lengthy discourse. A rhetorical question is to be considered a question.

When the teacher is speaking, the first two sections are to be checked to indicate "Teacher," and whether the teacher made a statement or asked a question. Next, you are asked to indicate whether the teacher gave verbal evidence of having heard the input from the student. If the teacher introduces a new or unrelated topic, or introduces a topic at the start of the class period, a check is to be placed in the area labeled "new." If he is dealing with administrative matters, a check is to be placed under "Administration." Control problems, classroom assignments, etc., require that a check be placed under "other."

Verbal evidence of having heard the student input is to be tabulated in one of four columns relating to how that input was used. The categories include:

Repeating, rephrasing, or paraphrasing the input;

Advancing, elaborating, or otherwise building upon the input;

Referring to earlier input from students; and,

Summarizing.

Under each of these categories you are to indicate whether the teacher used "key" words from the student input. This may occur with few exceptions for instances of repeating, but may not necessarily occur with rephrasing or paraphrasing. It probably will occur frequently with most instances of summarization.

Again, as with student input, teacher statements will vary from a single word to a lengthy discourse. Each instance is to count as one unit, unless you are clearly able to distinguish the unit into segments. An example would be a situation such as answering a question, and then

switching to a new topic, or asking a question of the same or another student.

Teacher remarks such as "good," "okay," "all right," etc. do not give verbal evidence that the teacher actually heard the student. They are to be tabulated in the "Acknowledge" column.

The following examples will help to clarify the types of behavior that would ordinarily be placed in certain categories. It is to be expected that some behaviors on the tapes will be difficult to categorize simply because of the ambiguity of the data. If such are found, or if it is impossible to make a judgment, or if the sound is inaudible for a particular statement, place a mark in the last column on the right.

Examples

Repeating, Rephrasing, Paraphrasing, with key words:

Teacher: "Okay, the Second World War."

Teacher: "Yes, the balance of power influences domestic appropriations."

Teacher: "You mean that he was wrong when he indicated that he needed two parts of hydrogen to one part of oxygen?"

Repeating, Rephrasing, Paraphrasing, without key words:

Student: "Athletics helped me form close friendships."

Teacher: "Competitive group endeavors often result in increased appreciation of other individuals."

Advance, Elaborate, etc., with key words:

Student: "Athletics helped me form close friendships."

Teacher: "You will probably find that those friendships will last for a long time after you have finished school."

Teacher: "Okay, you say you believe that leaders are born rather than made. Do you think that Lincoln, Napoleon, Hitler, or Stalin would have been leaders had they lived in different countries at other periods of time?"

Advance, Elaborate, etc., without key words:

Teacher: "If you applied that same line of reasoning to the present decade, what might the economic consequences be?"

Teacher: "If we were to interpret the works of Shakespeare by the same literary standard you just used, we would upset quite a few people who think he was a great writer."

Teacher: "Your suggestion might result in chaos; can you imagine what would happen if the same privileges were granted to persons who were obviously mentally deranged?"

Referring to earlier input from students, with key words:*

Teacher: "Earlier in this discussion, John mentioned the same point with reference to marijuana. But your suggestion does not acknowledge his contribution."

Referring to earlier input from students, without key words:

Teacher: "How would you relate that to what John said earlier?"

Acknowledge:

Teacher: "Okay."

"Good."

"You are right."

"Will you explain that again?"

"What do you mean by that?"

"Does anyone have a different opinion?"

"I like what you have said."

*If earlier input is referred to and elaborated or advanced, the check should go in the "Advance, Elaborate" category.

Teacher: "Go on."

"Continue."

"Why not?"

"Tell us more about your idea."

Introducing a new or unrelated topic:

Teacher: "I think we have exhausted this point. Let's go on to discussion of another theory."

Teacher: "Tomorrow we will be discussing black power. What reading materials have you found that you think would be helpful to others?"

Administrative matters, Control problems, etc.:

Teacher: "Today we are going to begin the unit on geometry."

Teacher: "Sally, pay attention!"

Teacher: "Read through page 202 for tomorrow's discussion."

Teacher: "Please be quiet."

Teacher: "What I would like for you to do now is to. . . ."

RATING FORM

Intern ______________ Tape Number ______________ Rater ______________

Page _____ of _____ page

Tch Time _____ Class ______

Student		R - R		A - A		Early		Summ		Ack-now	Teacher		New	Adm	Other
S	Q	Key	No Key	Key	No Key	Key	No Key	Key	No Key		S	Q			

APPENDIX C

CORRELATION MATRICES FOR MEANS OF CLASSROOM DISCUSSION VARIABLES

CORRELATION MATRIX OF MEANS OF CLASSROOM DISCUSSION VARIABLES, UNADJUSTED FOR RATIO OF TEACHER-TALK TIME FOR 36 SUBJECTS*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	--	01	04	53	28	33	01	-09	14	-04	22	00	-20	07	24	34	21	02	43	23	36
2		--	33	32	13	24	-02	16	34	20	32	75	13	75	08	73	02	98	24	14	60
3			--	06	08	34	12	61	62	34	42	18	-01	43	-06	42	-07	51	09	28	32
4				--	44	33	28	11	30	-19	30	32	-10	26	62	64	57	31	76	35	75
5					--	22	30	16	06	25	72	31	06	48	70	64	71	14	92	35	80
6						--	38	07	-10	09	24	43	-02	47	09	47	05	29	30	87	40
7							--	14	-08	02	16	36	10	27	38	23	32	01	34	78	32
8								--	65	21	35	01	-14	19	12	27	16	28	16	11	28
9									--	14	32	02	-06	18	11	36	10	44	18	-11	34
10										--	74	13	32	57	-05	27	-07	25	10	13	19
11											--	19	12	64	46	63	46	38	65	30	70
12												--	31	83	18	72	05	72	36	48	61
13													--	31	-05	10	-08	12	00	03	05
14														--	13	85	05	77	46	49	71
15															--	33	97	06	78	27	65
16																--	28	75	74	45	93
17																	--	01	76	21	62
18																		--	23	19	61
19																			--	41	91
20																				--	45
21																					--

* Decimal Points Omitted.
$p < .05$ for $r = .32$

1: Teacher-Talk Time
2: Repeat--Rephrase With Key Words
3: Repeat-Rephrase Without Key Words
4: Accept-Advance With Key Words
5: Accept-Advance Without Key Words
6: Ref. to Earlier Input With Key Words
7: Ref. to Earlier Input Without Key Words
8: Summarization With Key Words
9: Summarization Without Key Words
10: Acknowledgment
11: Number of Teacher Statements
12: Number of Teacher Questions
13: Administrative or Other
14: Student Statements Responded to by Teacher
15: Student Questions Responded to by Teacher
16: Student Statements Used by Teacher
17: Student Questions Used by Teacher
18: Total Repeat-Rephrase
19: Total Accept-Advance
20: Total Reference to Earlier Input

CORRELATION MATRIX OF MEANS OF CLASSROOM DISCUSSION VARIABLES, ADJUSTED FOR RATIO OF TEACHER-TALK TIME FOR 36 SUBJECTS*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	--	07	04	13	-16	09	-12	05	06	-13	65	-18	15	05	-03	12	04	06	16	-23	07
2		--	21	-05	03	10	14	32	22	06	03	32	32	30	21	08	03	-08	-40	51	14
3			--	17	03	-08	07	10	33	18	02	-08	-08	08	06	-16	25	-16	-15	-10	11
4				--	21	34	25	18	-02	05	24	05	-18	15	-36	16	16	-10	20	12	25
5					--	-02	08	20	21	01	-02	02	19	26	-02	-03	-05	09	-21	-11	05
6						--	37	30	-10	25	27	10	-04	-22	06	15	17	31	26	39	30
7							--	21	-09	-03	12	14	-05	13	-16	-10	-03	15	-05	23	20
8								--	59	24	30	08	14	24	04	-13	-04	-05	-14	21	-14
9									--	11	06	-19	15	26	-01	-19	-17	-20	-21	16	-14
10										--	-02	11	14	03	37	38	03	00	36	-13	12
11											--	01	-13	24	-37	-11	28	02	31	-07	19
12												--	04	21	09	-04	17	41	00	30	27
13													--	26	56	29	-19	17	-11	-13	-10
14														--	-21	-07	14	-06	-03	03	23
15															--	29	-21	17	-08	-31	-25
16																--	17	-02	30	-08	10
17																	--	06	16	11	39
18																		--	08	10	01
19																			--	-16	28
20																				--	12
21																					--

*Decimal Points Omitted.
$p < .05$ for $r = .32$

1: Repeat-Rephrase With Key Words
2: Repeat-Rephrase Without Key Words
3: Accept-Advance With Key Words
4: Accept-Advance Without Key Words
5: Ref. to Earlier Input With Key Words
6: Ref. to Earlier Input Without Key Words
7: Summarization With Key Words
8: Summarization Without Key Words
9: Acknowledgement
10: Total Reference to Earlier Input
11: Total Use of Input by Teacher
12: Number of Teacher Statements
13: Number of Teacher Questions
14: Administrative or Other
15: Student Statements Responded to by Teacher
16: Student Questions Responded to by Teacher
17: Student Statements Used by Teacher
18: Student Questions Used by Teacher
19: Total Repeat-Rephrase
20: Total Accept-Advance
21: Teacher-Talk Time

APPENDIX D

MEMORANDUM INVITING INTERNS TO PARTICIPATE IN EVALUATION OF LISTENING TRAINING STUDY

TO: Stanford Intern Teachers April 17, 1969

FROM: Richard E. Snow
Robert H. Koff
Robert E. Lundgren

SUBJECT: Communication Skills Study

The Stanford Center for Research and Development in Teaching is conducting research to develop programs to improve oral communication between teachers and students. We are specifically interested in having your evaluation of a listening training program that has been developed and marketed by the Xerox Corporation. We are able to offer payment of $5.00 for your participation in the evaluation.

The Xerox program is an audiolingual course designed to help people capture the critical content of what they hear. Both the content and method used in the program are of potential importance for teachers and students, and we thus invite your participation in evaluation of the overall usefulness of the program in education. Participation in the study would require approximately 2 1/2 hours of your time. The program may be scheduled for a weekday evening or Saturday morning; your preference is requested on the attached form.

In addition to payment, participants will be able to keep the training material used in the program, and will receive a summary of the results of the study. Complete anonymity will be assured in any records or reports that develop from the study, and performance will in no way be reflected in any individual's records.

We think that you will find this to be a useful experience directly relevant to teaching, and we hope that you will participate. We can accommodate a maximum of sixty people. Please respond on the attached form at your earliest possible convenience. We will then contact you concerning arrangements if your reply is affirmative and you are among the first sixty to respond.

Sincerely,

RICHARD E. SNOW
Acting Director of the Center

ROBERT H. KOFF
Director, STEP

ROBERT E. LUNDGREN
Research Assistant

APPENDIX E

INSTRUCTIONS TO CONTROL GROUP PRIOR TO ADMINISTERING LISTENING TESTS

Thank you for your willingness to assist with the evaluation of the listening training program. We are attempting to obtain professional evaluations of two programs developed by the Xerox Corporation. One is a lengthy program that requires about 3 hours; the other is an abbreviated program that requires about one hour.

The program you will be evaluating is the abbreviated one. You will be asked to listen to four statements, and to write summaries that include key points of each statement. A tone will sound after each of the four statements, at which time the recorder will be stopped and you will be asked to write the summary. The statements are related to different subjects, and will include speakers with different accents. Some statements will have background noises and other distractions.

It should be emphasized that this is a training program and not a test. Your summaries will be returned to you in approximately one week. To provide complete anonymity, summaries will in no way be marked to indicate an evaluation of your work. You will, however, be provided with a list of the main points of each summary, for your own analysis of performance.

In addition, you will be given a summary of results of the evaluation of this program as well as the longer one. After reviewing the results, you may wish to also take the longer training program. If so, it will be made available at your convenience.

Please do not take notes during the statements, and do not start to write your summaries until the tone has sounded.

APPENDIX F

MEMORANDUM FROM SUPERVISOR OF INTERNS CONCERNING CLASSROOM RECORDINGS AFTER LISTENING TRAINING

STANFORD UNIVERSITY
SCHOOL OF EDUCATION
SECONDARY TEACHER EDUCATION PROGRAM

MEMORANDUM: April 24, 1969

To: All Interns

From: Lew Knight

Subject: Video-taping during remainder of school year

As you are aware, availability of video-taping equipment has seriously limited the number of times that it would have been desirable to obtain classroom recordings during the current school year. As a result, some interns have been recorded only once or twice, and some have not been recorded at all.

We will be attempting to schedule recordings of as many interns as possible during the closing weeks of the school year, however, and will be contacting you concerning arrangements through supervisors and personnel in the Audio-visual office. It will be of great help to us if you will attempt to assist us by scheduling recordings during class periods when primary emphasis is on discussion rather than during a presentation or examination.

We regret the factors that have precluded the opportunity for greater utilization of video recordings for self and supervisory feedback during the year, but hope that this final recording will be helpful to those of you who can be scheduled.